Anesthesia in rabbit, guinea pig and ferret: Complications and descriptions of protocols.

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June 2019 – Faculty of Veterinary Medicine

Objectives

- To evaluate the reasons for a higher mortality related to anesthesia in exotic animals, focusing in rabbits, guinea pigs and ferrets.
- To describe anesthesic protocols for the studied species.

Anesthetic monitoring

Anesthesia is a 3-part complex procedure that starts when the patient is taken into custody and ends when it is discharged. Every part or moment has its own important factors to monitor or consider, which are:

- Pre-anesthetic moment: Stress of hospitalization, fasting, catheterization, premedication, analgesic and induction drugs and intubation.
- Anesthetic moment: Circulation and peripherical perfusion, oxygenation, ventilation, temperature, glucose level and maintenance drugs.
- Post-anesthetic moment: Stress of hospitalization, circulation and peripherical perfusion, oxygenation , ventilation, temperature, analgesic drugs, food intake and fecal output.

Table 1. Pharmacological protocol in the rabbit.

RABBIT		Premedication	Induction	Manitenance
ASA I-II	Diagnostic procedure	- Ketamine + Diazepam - Medetomidine/Dexmedetomidine + Ketamine + Butorphanol/Buprenorphine - Midazolam + Butorphanol	- Ketamine + Diazepam - Medetomidine + Ketamine + Buprenorphine	- Isoflurane
	Simple surgery	- Medetomidine/Dexmedetomidine + Ketamine + Butorphanol/Buprenorphine - Only analgesia: Meloxicam + Butorphanol	- Medetomidine + Ketamine + Buprenorphine	- Isoflurane
	Complex surgery	- Hypnorm® (Fentanyl + Fluanisone) Only analgesia: Meloxicam + Buprenorphine	- Midazolam/ Diazepam/ Propofol/ Alfaxalone	- Sevoflurane
ASA III-V	Diagnostic procedure	- Ketamine + Diazepam - Medetomidine/Dexmedetomidine + Ketamine + Butorphanol/Buprenorphine	- Ketamine + Diazepam - Medetomidine + Ketamine + Buprenorphine	- Isoflurane
	Simple surgery	- Midazolam + Buprenorphine Only analgesia: Meloxicam + Buprenorphine	- Ketamine	- Isoflurane
	Complex surgery	- Hypnorm® (Fentanyl + fluanisone) - Midazolam + Buprenorphine	- Midazolam/ Diazepam/ Propofol/ Alfaxalone - Ketamine	- Isoflurane

Table 2. Pharmacological protocol in the guinea pig.

GUINEA PIG		Premedication	Induction	Maintenance
ASA I-II	Diagnostic procedure	- Midazolam - Diazepam	- Sevoflurane - Etomidate ketamine + diazepam	- Sevoflurane
	Simple surgery	- Midazolam (+ opioids for analgesia) - Hypnorm ® (Fentanyl + fluanisone) - Diazepam	- Sevoflurane - Diazepam / Midazolam - Etomidate	- Sevoflurane
	Complex surgery	- Midazolam (+ opioids for analgesia) - Hypnorm® (Fentanyl + fluanisone)	- Sevoflurane - Diazepam / Midazolam	- Sevoflurane
ASA III-V	Diagnostic procedure	- Midazolam - Diazepam	- Sevoflurane - Etomidate	- Sevoflurane
	Simple surgery	- Midazolam (+ opioids for analgesia) - Diazepam	- Sevoflurane - Etomidate	- Sevoflurane
	Complex surgery	- Midazolam (+ opioids for analgesia) - Hypnorm® (Fentanyl + fluanisone) - Medetomidine + Midazolam + Fentanyl	- Sevoflurane - Diazepam / Midazolam - Medetomidine + Midazolam + Fentanyl	- Sevoflurane - Same combination - Same combination

Table 3. Pharmacological protocol in the ferret.

FERRET		Premedication	Induction	Maintenance
ASA I-II	Diagnostic procedure	- Diazepam - Midazolam o diazepam + Antacid drugs	- Etomidate - Propofol	- Isoflurane
	Simple surgery	- Diazepam - Midazolam o diazepam - Ketamine + diazepam + Antacid drugs	- Etomidate - Propofol - Ketamine + diazepam	- Isoflurane
	Complex surgery	- Diazepam - Midazolam o diazepam - Ketamine + midazolam + Antacid drugs	- Etomidate - Propofol - Ketamine + midazolam	- Isoflurane
ASA III-V	Diagnostic procedure	- Diazepam + Antacid drugs	- Etomidate	- Isoflurane
	Simple surgery	- Diazepam - Ketamine + diazepam + Antacid drugs	- Etomidate - Ketamine + diazepam	- Isoflurane
	Complex surgery	- Diazepam - Ketamine + midazolam + Antacid drugs	- Etomidate - Ketamine + midazolam	- Isoflurane

Conclusions

Exotic animals such as rabbits, guinea pigs or ferrets have certain anatomical, metabolic and behavioural particularities that make anesthetic monitoring more essential and more difficult. There are important factors that must be monitored from before premedication, after it and especially after anesthesia. In the described protocols it has been tried to simplify the complexity around the control of anesthesia and its possible derived complications, establishing a high standard to take as a reference regarding monitoring. Furthermore, it has been tried to find appropriate pharmacological combinations for the studied species and the needs of daily practice.